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TWO NEW SPECIES OF *HEXORTHODES* (LEPIDOPTERA: NOCTUIDAE) FROM TEXAS AND ARIZONA

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Abstract.—Two new noctuid moths, *Hexorthodes emendata* and *Hexorthodes citeria* are described from material from Texas and Arizona. Imagines and male and female genitalia are figured. The closely related species, *H. accurata* (Henry Edwards), is also figured.

Two new species of *Hexorthodes* McDunnough are described from material collected in Texas by both authors. The type series of one, *Hexorthodes citeria*, also includes several Arizona specimens collected by J. G. Franclemont. The larva of *citeria* has been described and illustrated by Godfrey (1972, pp. 167, 168, and p. 265, fig. 547) from ova obtained from a female collected by Franclemont. Although Franclemont had recognized this species as new, he has graciously permitted the authors to describe it here with *emendata*. Both new species are closely related to *accurata* (Henry Edwards), which was described from Arizona. According to Franclemont (pers. com.), there is a third undescribed species in the *accurata* group, which occurs in Mexico and Central America.

Hexorthodes emendata Blanchard & Knudson, New Species

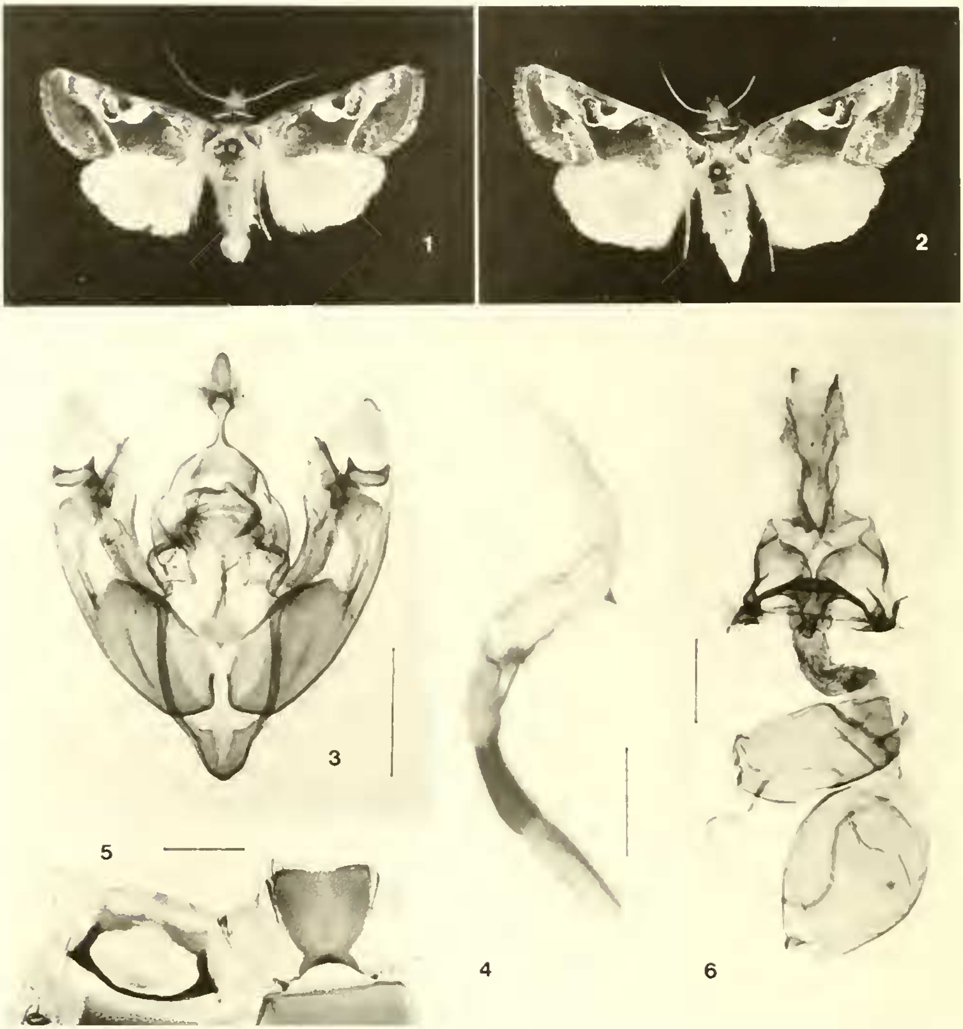
Figs. 1–6

Head.—Front smooth, grayish white (clay color). Vertex tufted, pale reddish brown. Labial palpi reddish brown, oblique, total length equal to one eye diameter. Antennae clay color, bipectinate in male, minutely bipectinate in female.

Thorax.—Anterior third pale reddish brown, with a flat fan shaped anterior tuft. Posterior ⅔ pale charcoal gray, patagia margined with white.

Abdomen buff colored, with conspicuous, copper colored dorsal tuft on 1st segment.

Forewing.—Ground color bright reddish brown (copper color), veins outlined narrowly with blackish gray. Basal half line white, angled outward from costal margin. Antemedial line obscure, apparent only at costa and near dorsal margin, angled inwardly over cell to meet basal half line. The area within the antemedial line much suffused with grayish white and blackish scales, with extreme base mainly whitish. Orbicular pale clay color, an elongate oval, extending from near costa to lower inner margin of reniform, to which it is usually narrowly joined. Reniform charcoal gray, margined with a ring of pale clay color. Postmedian line well defined, whitish, smooth and slightly outwardly convex from costal margin



Figs. 1–6. *Hexorthodes emendata.* 1, Holotype ♂. 2, Paratype ♀, same data as holotype. 3, ♂ genitalia of paratype, slide AB 3667 (aedeagus omitted). 4, Aedeagus with inflated vesica, paratype, same specimen and slide as Fig. 3. 5, Sclerotization of 8th abdominal segment (sternite on the left) of paratype, slide ECK 965. 6, ♀ genitalia of paratype, slide AB 3661. Segments in Figs. 3–6 represent 1 mm.

at ¼ the distance from apex. Subterminal line whitish, irregular and poorly defined over middle, the space between it and the postmedian line charcoal gray, suffused with whitish over costal ⅓. The space between reniform and postmedian line also suffused with whitish. Terminal line absent, fringe charcoal gray, with bases of scales clay color.

Hindwing white, semitranslucent, suffused with dull reddish brown along termen and with a narrow brownish terminal line. Veins slightly darkened. Fringe whitish.

Length of forewing.—Males: N = 11, 12.5–15.8 mm, average 13.9 mm. Females: N = 10, 13.7–16.3 mm, average 14.8 mm.

Male genitalia (Figs. 3–5).—Valva with well developed clasper, basal sclerite expanded posteriorly, clasper proper directed dorsally. Costa well sclerotized, with weak editum; digitus well developed, with short, equal sized, dorsal and ventral processes. Costal lobe of sacculus oblique, unarmed. Juxta a well sclerotized, elongate plate, expanded anteriorly, pointed posteriorly. Aedeagus elongate, slightly curved. Vesica with small thornlike cornutus at base and single larger thornlike cornutus near middle. Sclerotized sternite and tergite of eighth segment shown in Fig. 5.

Female genitalia (Fig. 6).—Sterigma with well sclerotized, crescent shaped lamina antevaginalis. Apophyses anteriores minute. Ductus bursae sigmoid, well sclerotized. Corpus bursae membranous, with large diverticulum, bearing ductus seminalis; signum absent.

Holotype (Fig. 1).—♂, Texas, Jeff Davis Co., Ft. Davis 11-VI-69, collected by A. & M. E. Blanchard and deposited in the U.S. National Museum of Natural History.

Paratypes.—Same data as holotype, 3 ♂ (genitalia on slide AB 3663), 2 ♀; same locality, 12-VII-64, 2 ♀; 25-VI-65, 1 ♂, 1 ♀; 11-VII-69, 1 ♂. Jeff Davis Co., Ajuga Canyon, 18-V-68, 2 ♀ (genitalia on slide AB 3661; Mt. Locke, 10-VI-69, 2 ♀. Presidio Co., Ruidosa-Hot Spring, 8-VII-69, 1 ♀. Culberson Co., Guadalupe Mts., McKittrick Canyon, 23-V-68, 2 ♂; Sierra Diablo Wildlife Mgmt. Area, 5-VI-69, 1 ♂; 6-VI-69, 1 ♂; 7-VI-69, 3 ♂, 1 ♀; 8-VI-69, 1 ♂; 11-VII-71, 1 ♂; 14-VII-71, 1 ♂, 1 ♀; 15-VII-71, 2 ♂, 6 ♀ (genitalia on slide AB 3659). Brewster Co., Big Bend Nat'l. Park, Chisos Basin, 8-VII-64, 1 ♂; 29-VI-65, 2 ♂ (genitalia on slide AB 3665); Green Gulch, 27-VI-65, 1 ♂; 1-VII-65, 2 ♂ (genitalia on slides AB 394 and AB 3667); Oak Spring, 11-V-66, 1 ♂. All the above collected by A. & M. E. Blanchard. Jeff Davis Co., Davis Mt. State Park, 4-VII-76, 1 ♂, 1 ♀ (genitalia on slide ECK 965). Brewster Co., Big Bend Nat'l. Park, Green Gulch, 28-V-81, 1 ♂, collected by E. Knudson.

Hexorthodes citeria Blanchard & Knudson, NEW SPECIES

Figs. 7–12

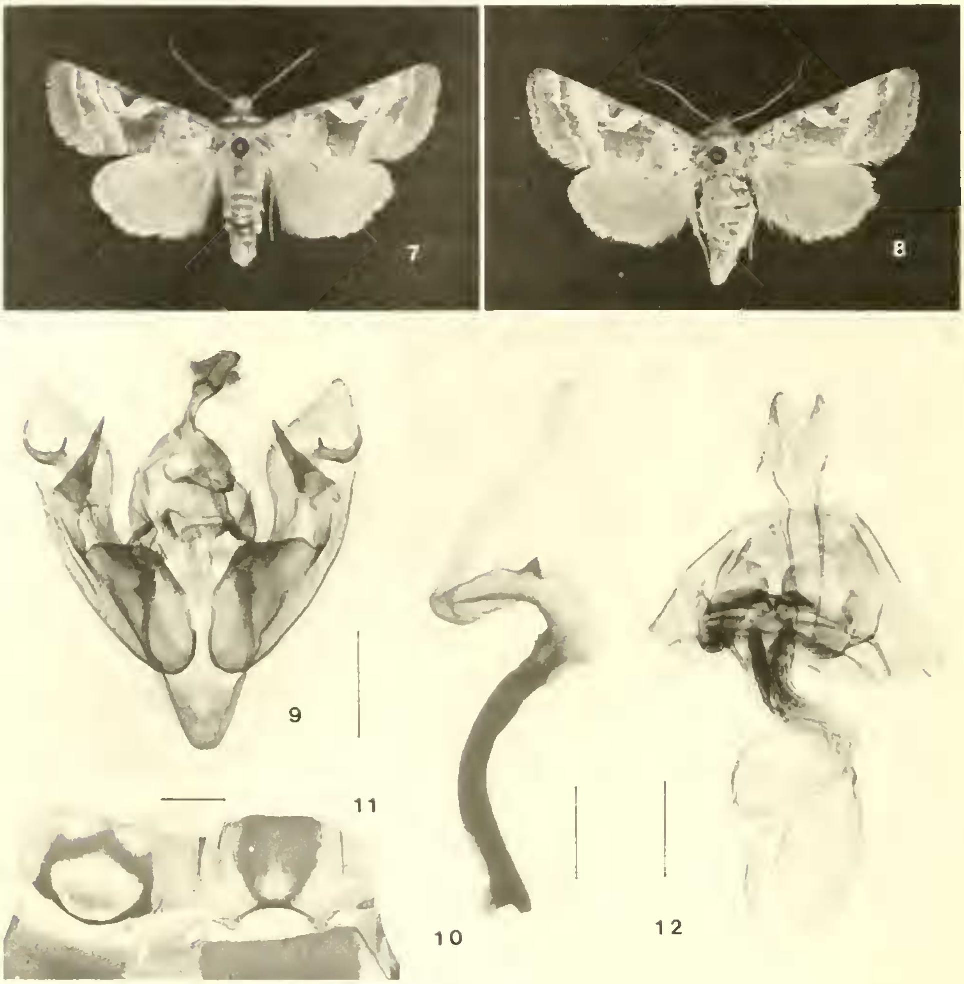
Head.—Similar to preceding, somewhat paler, palpi pale orange.

Thorax.—Similar to preceding, but lacking charcoal gray scaling posteriorly. General coloration pale orange.

Abdomen pale orange, posterior margins of segments whitish. Dorsal tuft on 1st segment hardly contrasting.

Forewing.—Ground color pale orange, darker in median area; veins not perceptibly darkened. Basal half line white, margined inwardly with orange brown, not angled. Antemedial line well defined, white, margined inwardly and outwardly with orange brown. The basal area, within antemedial line suffused with whitish. Orbicular and reniform much as in *emendata*, but more broadly joined, and reniform nearly as pale as orbicular. Postmedial line white, from costal margin at ⅓ the distance from apex, extending outwardly nearly parallel to costa for a short distance and thence sharply angled downward to dorsal margin. Subterminal line white, slightly irregular, but well defined throughout its length; the space between it and the postmedial line lightly suffused with whitish inwardly, and grayish outwardly. Terminal line absent. Fringe pale orange, bases of scales darker.

Hindwing opaque, pale orange, with darker terminal line. Veins not darkened. Fringe whitish.

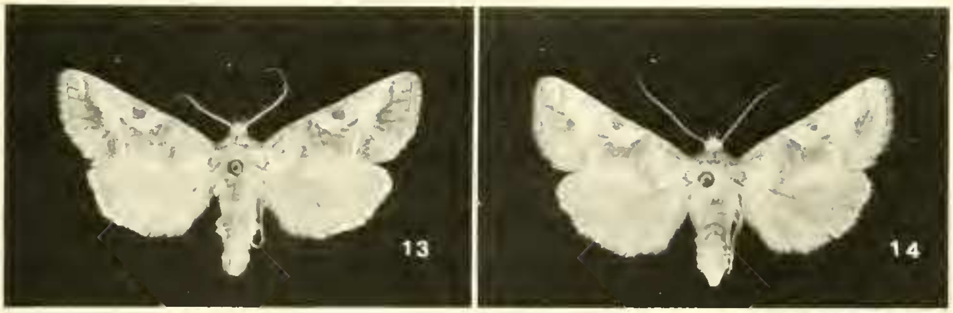


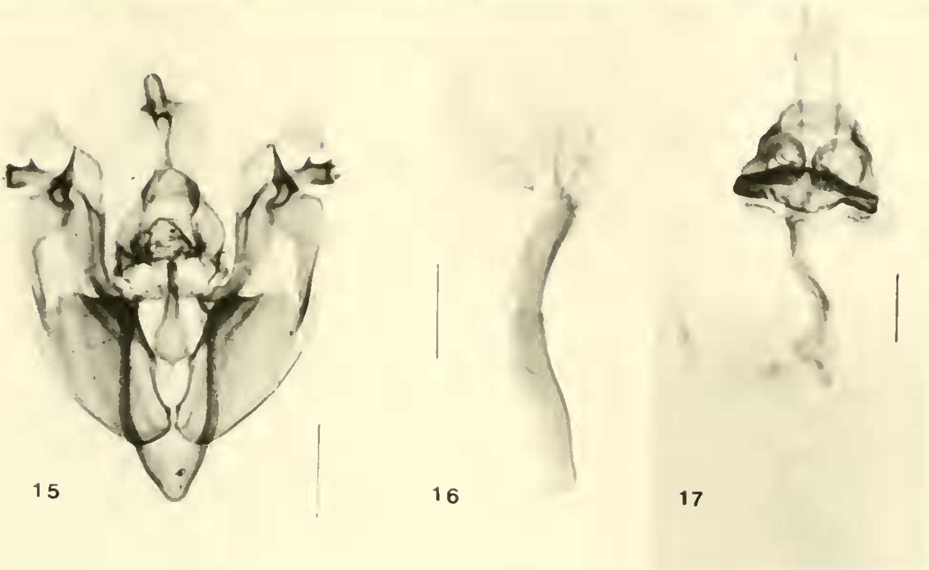
Figs. 7–12. *Hexorthodes citeria.* 7, Holotype ♂. 8, Paratype ♀, same data as holotype. 9, ♂ genitalia of paratype, slide AB 3668 (aedeagus omitted). 10, Aedeagus with inflated vesica, paratype on slide AB 5392 (by ECK). 11, Sclerotization of 8th abdominal segment (sternite on the left), slide AB 5391 (by ECK). 12, ♀ genitalia of paratype, slide AB 5390 (by ECK). Segments in Figs. 9–12 represent 1 mm.

Length of forewing.—Males: N = 10, 13.6–15.5 mm, average 14.5 mm. Females: N = 7, 14.5–16.3 mm, average 15.6 mm.

Male genitalia (Figs. 9–11).—Valva shorter and broader than *emendata*; clasper slightly longer, with basal sclerite shorter and less expanded posteriorly. Digitus with three processes; middle process minute, ventral process long and curved. Costal lobe of sacculus angled, armed with numerous short spines. Juxta as in *emendata*, but less sclerotized and shorter. Aedeagus with inflated vesica in Fig. 10 similar to *emendata*. Sclerotized sternite and tergite of eighth segment shown in Fig. 11.

Female genitalia (Fig. 12).—Sterigma with lamina antevaginalis a well sclerotized band, invaginated slightly at middle. Apophyses anteriores ⅓ the length of apophyses posteriores.





Figs. 13–17. *Hexorthodes accurata* (Hy. Edw.). 13, ♂, Santa Cruz Co., Arizona, Madera Canyon, 2-VII-59, J. G. Franclemont coll. 14, ♀, same locality & collector, 11-VII-59. 15, ♂ genitalia (aedeagus omitted), on slide J.G.F. 4291, same locality, 12-XII-60. 16, Aedeagus, vesica inflated, from slide J.G.F. 4291. 17, ♀ genitalia, on slide J.G.F. 4290, same data as Fig. 15. Segments in Figs. 15–17 represent 1 mm.

Holotype (Fig. 7).—♂, Texas, Jeff Davis Co., Ft. Davis, 11-VI-69, collected by A. & M. E. Blanchard and deposited in the U.S. National Museum of Natural History.

Paratypes.—Texas, all Jeff Davis Co., same data as holotype, 9 ♂ (genitalia on slides AB 3664, and AB 5389), 3 ♀; same locality, 12-VII-64, 1 ♀; 13-VII-64, 1 ♂; 25-VI-65, 3 ♂ (genitalia on slide AB 395); 26-VI-65, 1 ♂; 11-VII-69, 1 ♂ (genitalia on slide AB 3668), 1 ♀ (genitalia on slide AB 3660); 21-V-71, 1 ♀; Ajuga Canyon, 18-V-68, 1 ♀ (genitalia on slide AB 5390); Mt. Locke, 25-V-68, 1 ♀ (genitalia on slide AB 3662); 10–VI-69, 1 ♂ (genitalia on slide AB 5391), all collected by A. & M. E. Blanchard. Davis Mountains State Park, 4-VII-76, 1 ♂, collected by E. Knudson. Arizona, all Cochise Co., Cave Creek Canyon, 4800′, Chiricahua Mts., 2-VIII-66, 1 ♀ (genitalia on slide J.G.F. 5367); 21-VII-67, 1 ♀ (genitalia on slide J.G.F. 7140); 1-VIII-67, 1 ♂ (genitalia on slide J.G.F. 5414); Silver Creek Wash, 5140′, 2.2 m. NW of Portal, 29-VII-67, 1 ♀, all collected by J.G. Franclemont. Portal Ranger Station, Chiricahua Mts., 9-VIII-66, 1 ♀, collected by Robert G. Beard (in Coll. Franclemont).

Life history.—Last instar larva described and illustrated by Godfrey (1972, pp. 167, 168, 252 (figs. 448, 449), 265 (fig. 547), reared from ova obtained from a female collected by Franclemont at Cave Creek Canyon, Cochise Co., Arizona. Foodplant: *Brickellia* sp. (Compositae).

Remarks.—These two new species are closely related to *Hexorthodes accurata* (Henry Edwards) (Figs. 13–17). All three species can be distinguished by wing color and pattern, as well as male and female genitalia. *H. accurata* is most similar to *citeria* in coloration of the forewings, but the veins are darkened as in *emendata* and the subterminal line is poorly defined over middle, as in *emendata*. The hindwings of *accurata* are semitranslucent white, with brown veins. *H. emendata* is readily distinguished from the other two species by its rich coppery brown color and contrasting charcoal gray shade between the postmedial and subterminal lines. In male genitalia (Figs. 15, 16), *accurata* differs from the other two species in the digitus, which is more complex, with two dorsal spines and branched ventral process, each branch with several small thorn-like processes. The costal lobe of the sacculus of *accurata* resembles that of *citeria*.

The female genitalia differ chiefly in the size and shape of the lamina antevaginalis. In *accurata* (Fig. 17), this structure is well sclerotized, broadly subtriangular, with a broad central posterior protrusion and rounded lateral edges. In *accurata*, the ductus bursae is about twice the length of those of the other two species. *H. citeria* may also be distinguished by the relatively long apophyses anteriores, which are extremely small in the other two species. At this writing, it appears that *emendata* occurs only in west Texas, having been collected in the Chinati, Chisos, Davis, Guadalupe, and Sierra Diablo mountains, whereas *citeria* is known to occur only in the Davis Mountains of Texas, as well as the Chiricahua mountains of Arizona. *H. accurata* is known only from Arizona. It has also been reared on *Brickellia* sp. in Arizona (Godfrey, 1972), and is more common in the Chiricahua Mountains than *citeria* (Franclemont, pers. comm.). A large series of *H. accurata* in the U.S. National Museum of Natural History has been studied by R. W. Poole, who reports (pers. comm.) a considerable degree of variability in color and markings of this species. In the authors' series of the two new species, however, relatively little variation is noted.

ACKNOWLEDGMENTS

We are extremely grateful to J. G. Franclemont for providing specimens of *accurata* and *citeria* from Arizona, for providing much helpful information and encouragement, and for examining the plates and manuscript. We are also grateful to the National Park Service and to Texas Parks and Wildlife Dept. for providing access to collecting sites in Texas.

LITERATURE CITED

Godfrey, G. L. 1972. A review and reclassification of larvae of the Subfamly Hadeninae (Lepidoptera, Noctuidae) of America North of Mexico. U.S.D.A. Tech. Bull. 1450: 1–265.